

WHAT IS CLAIMED IS:

1. An aircraft auxiliary equipment precision alignment system comprising:  
an auxiliary equipment mount attached to the aircraft;  
an inertial reference unit (IRU) having means for removable attachment to an  
5 in-service avionics tray onboard the aircraft;  
a locating assembly having means for precision engagement with the auxiliary  
equipment mount, the locating assembly further having a mating means adapted to  
receive the IRU; and,  
a means for remote operation of the IRU.
- 10 2. An aircraft auxiliary equipment precision alignment system as defined in  
claim 1 wherein the means for remote operation comprises an extension cable  
assembly for operatively connecting the locating assembly to the avionics tray for  
remote operation of the IRU.
3. An aircraft auxiliary equipment precision alignment system as defined in  
15 claim 1 wherein the means for remote operation comprises a powerpack and remote  
display for the IRU connected to the locating assembly.
4. An aircraft auxiliary equipment precision alignment system as defined in  
claim 1 wherein the means for precision engagement comprises a common interface  
assembly having means for indexing to the auxiliary equipment mount and wherein  
20 the mating means comprises a model specific interface assembly having a connector  
block for electrical connection to the IRU and quick disconnect means for mechanical  
attachment of the IRU, the common interface assembly and model specific interface  
assembly having means for indexing and alignment.
5. An aircraft auxiliary equipment precision alignment system as defined in  
25 claim 4 wherein the auxiliary equipment mount comprises a plurality of brackets and  
the common interface assembly has a plurality of legs, equal in number to the  
plurality of brackets, each leg having first precision indexing holes for alignment with  
auxiliary equipment mounting holes in each respective bracket, the common interface  
assembly further having a surface plate attached to the legs and wherein the model  
30 specific interface assembly further comprises a second surface plate and the means for

- indexing and alignment comprises a second plurality of mating blocks extending from the surface plate opposite the legs and a third plurality of mating blocks, equal in number to and in spaced relation for engagement with the second plurality of mating blocks, extending from the second surface plate, the second surface plate further incorporating means to support the connector block opposite from the mating blocks.
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6. An aircraft auxiliary equipment precision alignment system as defined in claim 5 wherein the means for indexing and alignment further comprises second precision indexing holes in each of second and third plurality of mating blocks and locating pins received in the second precision indexing holes.
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7. An aircraft auxiliary equipment precision alignment system comprising:
- an auxiliary equipment mount having a plurality of brackets attached to the aircraft;
  - an inertial reference unit (IRU) having an electrical connector and mechanical quick disconnect for removable attachment to an in-service avionics tray onboard the aircraft;
  - 15 a locating assembly having
    - a common interface assembly including a plurality of legs, equal in number to the plurality of brackets, each leg having precision indexing holes for alignment with auxiliary equipment mounting holes in each respective
    - 20 bracket, the common interface assembly further having a surface plate attached to the legs,
    - a model specific interface assembly having a second surface plate and quick disconnect means for mechanical attachment of the IRU mounted to the second surface plate,
    - 25 a second plurality of mating blocks extending from the surface plate opposite the legs and a third plurality of mating blocks, equal in number to and in spaced relation for engagement with the second plurality of mating blocks, extending from the second surface plate; and,
    - a connector block for electrical connection to the IRU and a means for remote
    - 30 operation of the IRU.

8. An aircraft auxiliary equipment precision alignment system as defined in claim 7 wherein the means for remote operation comprises an extension cable assembly having a cable extending from the connector block and, mounted to the cable distal from the connector block, a simulator box having a connector
- 5 substantially identical to the IRU for electrically mating to the in-service avionics tray and quick disconnect substantially identical to the IRU for mechanically mating to the in-service avionics tray for operatively connecting the locating assembly to the avionics tray for remote operation of the IRU.
9. An aircraft auxiliary equipment precision alignment system as defined in
- 10 claim 7 wherein the means for remote operation comprises a powerpack and remote display for the IRU operably connected to the connector block of the model specific interface assembly.
10. An aircraft auxiliary equipment precision alignment system as defined in 1
- 15 further comprising a second IRU mounted in the aircraft for simultaneous operation during remote operation of the first IRU.
11. A method for precision alignment of auxiliary equipment on an aircraft comprising the steps of:
- attaching to the aircraft a mounting means intended for mounting the auxiliary equipment to the aircraft;
- 20 mounting a locating tool to the mounting means;
- obtaining aircraft attitude and heading using an inertial reference unit (IRU);
- removing the IRU from an IRU avionics tray in the aircraft;
- installing the IRU on the locating tool; and,
- operating the IRU to obtain attitude and heading.
- 25 12. A method for precision alignment of auxiliary equipment on an aircraft as defined in claim 11 wherein the step of mounting a locating tool comprises the steps of:
- mounting a common interface assembly to the mounting means; and
- mounting a model specific interface assembly to the common interface
- 30 assembly;

and wherein the step of installing the IRU comprises installing the IRU on the model specific interface assembly.

13. A method for precision alignment of auxiliary equipment on an aircraft as defined in claim 11 wherein the step of operating the IRU further comprises the initial  
5 step of connecting the locating tool to the avionics tray for remote operation of the IRU.

14. A method for precision alignment of auxiliary equipment on an aircraft as defined in claim 11 wherein the step of operating the IRU further comprises the initial  
10 step of connecting a powerpack and remote display for the IRU to the locating assembly.

15. A method for precision alignment of auxiliary equipment on an aircraft as defined in claim 14 wherein the remote display comprises a portable computer.

16. A method for precision alignment of auxiliary equipment on an aircraft as defined in claim 11 further comprising the steps of:  
15 comparing the aircraft attitude and heading using a second IRU mounted in the aircraft during the step of obtaining the aircraft heading with the first IRU; and  
substantially simultaneously reading the aircraft attitude and heading with the second IRU while performing the step of operating the first IRU to obtain attitude and heading while mounted on the locating tool.